

fied in contracts for work and to give the fundamentals of the work, but is scarcely full enough to be used as a guide by the amateur wood finisher. In the chapter on the uses of lumber, fifty-one uses, each taking over a million board feet per year are described. For each of these a table showing the percentages of the different woods used is given. For example, of the 56 million feet used in making boot and shoe findings—lasts, trees, pegs and wooden heels—maple furnishes 82%, birch, basswood and beech 17% and other woods 1%. In another chapter forty-six commercial woods are listed with the characteristics of each and the common uses. In this list the names are usually generic with the differences between species briefly given, so that the number of commercial woods is actually many more than appears at first. The botanist will find the chapters on the characters of wood, the commercial woods and the forest regions of interest, scout leaders will also find much of interest, but the real use of the book will be to those who use wood in construction, building or some form of manufacturing. The general appearance of the book, the paper used and the printing is all good. The many tables make it of value for reference. A key for the determination of the commoner commercial woods would have added to its value.

G. T. HASTINGS.

PROCEEDINGS OF THE CLUB

MEETING OF JANUARY 30, 1924

The meeting was held at The New York Botanical Garden. Dr. R. H. Cheney of New York was elected to membership. The resignation of Mrs. J. S. Ehrich was accepted.

Dr. Barnhart reported for the auditing committee that the treasurer's books had been examined and approved.

The program of the afternoon consisted of two interesting talks by Dr. J. K. Small and Dr. R. R. Stewart.

Dr. Small outlined a recent (December, 1923) excursion of exploration in Florida. About four thousand miles were covered in northern Florida and the peninsula. The itinerary extended from Jacksonville to the mouth of the Appalachicola River, then through the peninsula by several crossings to Cape Sable. Specimens and photographs were shown to illustrate (a) recently

naturalized species, (b) extension of geographic ranges, (c) very rare plants, such as a *Torreya* or Stinking Cedar (*Tunion taxifolium*), Florida-Yew (*Taxus floridana*), and Chapman-Honeysuckle (*Rhododendron Chapmanii*), (d) new species, and (e) new genera. Paintings of several species of iris were shown, the main object of the excursion having been the collection of material of this genus.

Dr. Stewart described the vegetation seen in his travels in Kashmir. An abstract of his talk was printed in the May-June issue.

ARTHUR H. GRAVES,
Secretary.

MEETING OF FEBRUARY 12, 1924

The meeting was held at the American Museum of Natural History and in spite of the unfavorable weather was well attended.

Dr. O. E. White, of the Brooklyn Botanic Garden, who was a member of the Mulford expedition for the Biological Exploration of the Amazon Basin, addressed the club on the forests of the Amazon, his title being "The Amazonian Wilderness."

Although the Amazon was first discovered as far back as 1541, Dr. White stated that the territory through which it flows is even now mainly the domain of rubber collectors, Brazil nut gatherers, and Indians. Notwithstanding the fact that it has two large cities—Para, located near one of its many mouths, with a population of 200,000 and Manaus with about 50,000 people, located about 800 miles further up the river, near the junction of two large tributaries, the Madeira and the Negro, the population of the whole Amazon basin is only about 600,000 and most of these are concentrated in the lower reaches of the river between Manaus and Para as well as in these two cities. These figures take on added significance when we realize that this whole Amazon basin is 45 times the area of New York State and $\frac{2}{3}$ the size of the United States. It was estimated in 1910 that only 25 square miles of this vast area were under cultivation.

Dr. White found that the real wilderness of the Amazon basin—the wildest part—lay in the triangle formed by the Andes Mountains as a base and the Negro and Madeira Rivers,

north and south branches, respectively, of the Amazon, as sides, meeting at a point near Manaos. As to the forests of the Amazon, he explained that they "are not dark and gloomy in the sense of our conifer forests—no mass effects of one type of tree or plant, but many diverse kinds in a small area, making foresting problems difficult. The trees were mostly of the hardwood type, their woods often rare and beautiful in coloring. The forests are full of 'perching,' i. e., epiphytic cacti, peppers, orchids, members of the pineapple family, and ferns, fastened to the trunks and branches and in the crotches of large trees. Floral displays in these forests are rare—only occasionally a bright daub of color from a single blooming tree or vine,—usually yellows, purples, reds and bright oranges—but the monotonous green as one drifts down the rivers on rafts or on steamers becomes very tiresome—one becomes 'green-tired.'"

"Many strange wild fruits and drugs are found in this region; in the upper Amazon basin chocolate or cacao grows wild with its pumpkin-colored pods and purple seeds. The orchid, vanilla, with yellow flowers and scented pods, clambers over and up the trees in many places. The common vanilla substitute is also there—the tonka bean tree.

Besides the harvesting of Brazil nuts, another industry is the collection of wild rubber; and although this now represents only a small per cent of the world's supply—the great bulk at present coming from the plantations of the Dutch East Indies and the Federated Malay States—yet it still holds the highest rank for quality. Two kinds of rubber are common: the Hevea or Para rubber, known as 'goma' and Castilloa or 'caucho'—the latter only half as valuable as the former. The Hevea tree is tapped from year to year, but in the case of Castilloa, the whole tree is cut down."

Among other interesting plants described by Dr. White were the Balsa tree, famous for its light wood, the Annotto tree, whose fruit yields the dye used commonly to color our butter, and the Brazil nut tree, whose nuts form such an important article of commerce.

Dr. White found that the main feature of the climate was its everlasting sameness—during the rainy season, continual rains day after day—and during the dry season, perpetual sunshine;

and this monotony becomes tiresome, productive of ennui and loss of energy.

ARTHUR H. GRAVES,
Secretary.

MEETING OF FEBRUARY 27, 1924

The meeting was held in the lecture room of the Museum of the New York Botanical Garden.

The following were elected to membership: Mrs. Frances L. Muller, New York City; Miss M. Georgina Biddle, New York City; Professor M. A. Chrysler, Rutgers College, New Brunswick, N. J.; Miss Mary A. Clark, Brooklyn.

The following resignations were accepted: Mrs. and Miss Langmuir, Mr. George T. Harrington, Mrs. Arthur L. Sproul, Professor H. F. A. Meier, Dr. Carl A. Schwarze, and Mr. W. T. Arnold.

Dr. C. E. Allen, of the University of Wisconsin, who is taking Dr. Harper's place at Columbia during the latter's absence in Washington, D. C., gave a talk illustrated with lantern slides on "Some variant characters of a liverwort (*Sphaerocarpus*) and their inheritance." Dr. Allen said that *Sphaerocarpus Donnellii*, like other species of the genus, so far as known, is strictly dioecious. The four spores formed by the division of a single spore mother cell remain adherent at maturity, at least under greenhouse conditions, with the exception of those produced by one clone. When the four adherent spores germinate, two develop into male gametophytes, two into female. Male and female gametophytes are characterized by the possession of different chromosome groups; one of the chromosomes of the female (the X-chromosome) is very large; the corresponding one in the male (the Y-chromosome) is very small. Both are present in the sporophyte and separated in the reduction divisions, so that, of the four spores formed from a spore mother cell, two receive the X-chromosome and can develop only into female plants; the other two receive the Y-chromosome and can develop only into male plants.

Races have been isolated which differ in several vegetative characters. The "tufted" character shows itself especially in the very variable form of the involucre. If a tufted female is

mated with a typical male, four classes appear among the gametophytic offspring; tufted females, typical females, tufted males, and typical males. Apparently the tufted offspring are more numerous than the typical offspring.

The "polycladous" character, first found in a male race, is marked by a profuse and irregular branching, the reduction or absence of involucre, and the presence of few antherids. The mating of a polycladous male with a typical female results in four approximately equal classes of gametophytic offspring. The polycladous females have thus far proved entirely sterile.

The sporophytes borne by the female plants of one clone produce spores that are separate at maturity instead of adherent in tetrads. The spore-separation character is inherited only through the female offspring of this clone, the transmission of this character following, therefore, the same course as that of the X-chromosome.

A semi-sterile male race has been isolated, resembling typical races except in the small proportion of antherids and involucre produced. Races of both sexes have also been found which differ in the proportion of appendages borne upon their involucre. The inheritance of these latter characters has not yet been studied.

ARTHUR H. GRAVES,
Secretary.

MEETING OF MARCH 11, 1924

This meeting was held at the Museum of Natural History. Professor Jean Massart of the University of Brussels gave an interesting address, illustrated with lantern slides, on the "Internal Sensations of the Norfolk Island Pine (*Araucaria excelsa*)."

Professor Massart pointed out that as regards the position and potentialities there are 6 kinds of buds on the stems of *Araucaria excelsa*: the active terminal bud of the main stem; the dormant lateral buds of the main stem; the active terminal bud of the primary branch; the dormant lateral buds of the primary branch; the active terminal bud of the secondary branch, and the dormant lateral buds of the secondary branch.

That there is an internal correlation of some sort existing between these different classes of buds is shown by experi-

mental work. For example, if the top of the main stem is removed, the dormant lateral buds immediately below the cut develop to replace the normal head, and of the new shoots from these, one develops more rapidly than the others, inhibiting their growth. Girdling experiments bring similar results, and grafting a secondary branch in the place of the main shoot reveals the fact that its nature cannot be thus changed to that of a main shoot.

ARTHUR H. GRAVES,
Secretary.

MEETING OF MARCH 26, 1924

The meeting of this date was held at the New York Botanical Garden.

The following were elected to membership: Mr. B. R. Abbott, New York City; Dr. William Crocker, Boyce-Thompson Institute for Plant Research, Yonkers, N. Y.; Miss Eunice Rogers, New York City, Mr. S. Fred Wright, Orange, N. J.

Three resignations were accepted: Mr. C. M. Shipman, Willoughby, Ohio; Mr. James A. Crawford; Miss Margaret Chapin, Brooklyn.

The Secretary read a communication addressed to the Club from Mr. W. G. Waterman, Chairman for Local Organizations of the Committee of the Ecological Society of America on the Preservation of Natural Conditions. The letter urged the cooperation of the Club in a movement looking toward the withdrawal of the region surrounding Glacier Bay from entry, and the making of a national monument of the same for the purpose of preserving intact for science the glaciers and the surrounding region. It was suggested in this letter that the Secretary of the Club be authorized to write letters to Hon. Hubert C. Work, Secretary of the Interior, Washington, D. C., and to Mr. Stephen Mather, Director of the National Park Service, Washington, in furtherance of this movement.

On a motion of Dr. Howe, which was seconded by Dr. Rydberg, with the approval of the Club, the Secretary was so empowered.

The scientific program of the meeting consisted of two talks. The subject of the first, by Margaret A. Graham of Hunter College, was "Fertilization in the Liverworts with Special

Reference to *Preissia quadrata*." For both this and the following paper microscopic slides demonstrating the various stages were placed on view.

Miss Graham reviewed the work on fertilization in the liverworts, as follows:

In 1891, Kruch observed that the antherozoids of *Riella Clausonia* enlarge at once upon entering the cytoplasm of the egg and that the body of the male pronucleus divides into eight chromosomes. The two pronuclei become almost equal in size when in contact.

Rickett (1923) observed that both the male and female pronuclei in *Sphaerocarpus* form chromosomes and that the nuclear membrane of each breaks down.

Humphrey (1906) observed the antherozoid when still a curved rod, lying in contact with the egg nucleus of *Fossombronina longiseta*.

In *Ricciacarpus natans*, Garber (1904) observed that the male pronucleus was half the size of the female pronucleus and that they were in contact.

In *Riccia Frostii*, Miss Black (1913) observed the male pronucleus in the egg cytoplasm near the female pronucleus.

Woodburn (1914) observed the two pronuclei in the cytoplasm of *Reboulia hemispherica*, Sharpe (1921) made a similar observation for *Anthoceros* and Mayer (1911) for *Corsinia Marchantoides*.

In *Preissia quadrata*, Miss Graham observed that the antherozoid enlarges at once upon entering the cytoplasm of the egg and moves near to but not in contact with the female pronucleus. At this time a centrosphere may be observed in the egg cytoplasm near the antherozoid. While the antherozoid is in this position, differentiation takes place, resulting in a typical nucleus in prophase. The contents of the female pronucleus before fertilization is massed around the nucleolus; after fertilization, however, the nucleus enlarges and its chromatin appears in masses, thin threads running between them. At opposite poles of the female pronucleus centrospheres may be seen.

The second paper was by Dr. Mabel L. Merriman, also of Hunter College, the subject being "Some Changes in the Cell Contents of *Spirogyra* during Conjugation."

Dr. Merriman said that after the union of the gametangia

there is a decided difference in the staining reactions of the conjugating cells and those which are not conjugating. The conjugating cells are clearer, not taking the stain so readily. This "clarification" seems general in the conjugating cells and may possibly be connected with the fact that their cell walls are thinner. The substances in suspension may have gone into solution. In the conjugating cells also, the nuclei at first seem to draw apart a little as if repelled. Sometimes two male cells conjugate with one female cell. In general, previous to conjugation, the pyrenoids are much larger.

A short discussion followed on the cause of conjugation, with the conclusion that it was probably essentially chemotactic.

An interesting specimen of a woody plant (*Bachira alba*) from the island of St. Thomas was shown by Dr. Britton. The bark was of a very corky nature and showed in places on the surface a peculiar green color.

ARTHUR H. GRAVES,
Secretary.

MEETING OF APRIL 8, 1924

This meeting was held at the American Museum of Natural History. Professor Richards occupied the chair. The Secretary of the Club gave an illustrated talk on the Civic Value of Trees, describing the life and growth of trees and the unfavorable conditions to which city trees are subjected, the diseases to which they are liable and correct methods of planting and treatment. The value of trees to a city was summed up as follows:

1. Beautify the city, making it a more desirable dwelling place.
2. Source of interest and pleasure at all times of the year.
3. Afford cooling shade throughout the hot summer period.
4. Enhance the value of real estate.
5. Improve the general morale of the community.

ARTHUR H. GRAVES,
Secretary.

MEETING OF APRIL 30, 1924

The meeting of this date was held in the Laboratory Building of the Brooklyn Botanic Garden.

Mr. Charles W. Deusner of the Boyce-Thompson Institute for Plant Research, Yonkers, New York, was elected to membership.

The communication from the Club to the Secretary of the Interior advocating withdrawal from entry of the region surrounding Glacier Bay, Alaska, with a view to the establishment of a national park there; and the reply of Mr. Arno B. Kammerer, Acting Director of the National Park Service, stating that a study of the ground is being made, were read by the Secretary, and by motion of Dr. Seaver were placed on file.

The proposition of Dr. R. C. Benedict, Chairman of the Special Committee to secure legislation for the protection of the native plants in the State of New York, that the Club appropriate \$25 for the reprinting of the Brooklyn Botanic Garden Leaflet "Conservation of Beauty," and distribution of same to the school teachers of New York was put before the Club. On motion of Dr. Murrill, the proposition was referred to the finance committee of the Club with power.

Dr. James A. Faris, Research Fellow at the Brooklyn Botanic Garden, addressed the Club on "Factors Influencing Infection in the Covered Smut of Barley."

Dr. Faris reported that owing to a failure to receive adequate and consistent infections in attempts to determine the varietal resistance to the covered barley smut, an extensive study of the factors influencing infection was undertaken.

As the tabulated data and the photographs shown by lantern slides demonstrated, high infections were secured over a wide range of soil moisture, acidity and temperature. In fact very high infections were secured over much wider ranges of soil factors than are met with under field conditions. In attempting to correlate these data with previous failures, it was discovered that collections of smut from different localities and upon different varieties of barley varied in their ability to infect certain varieties. Further studies have demonstrated that this single morphological species of smut is made up of several biologic forms, some of which were shown in a trip through the experimental greenhouses.

ARTHUR H. GRAVES,
Secretary.